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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
TANG, KENNETH

ART UNIT	PAPER NUMBER
2195	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/084,214	MCKEAN ET AL.	
	Examiner	Art Unit	
	KENNETH TANG	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's arguments are in response to the RCE filed on 3/12/08. Applicant's arguments have been fully considered but are moot in view of the new grounds of rejections.

2. Claims 1-42 are presented for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1- 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning et al. (hereinafter DeKoning) (US 6,073,218) in view of Perego (US 2002/0171652 A1), and further in view of Silberschatz et al. (hereinafter Silberschatz) ("Operating System Concepts: Fifth Edition", John Wiley & Sons, Inc., 1999).

DeKoning and Silberschatz were cited in the previous office action.

4. As to claim 1, DeKoning teaches a mass storage controller system (see Abstract, Fig. 1, 100), comprising:

a plurality of controllers (RDAC #1, Fig. 1, 118.1 and RDAC #2, Fig. 1, 118.2) for controlling an array of storage devices (plurality of Disk Drives 110), each of the plurality of controllers comprising:

a CPU for controlling the operation of a controller (Fig. 1, item 112.1);

program memory, coupled to the CPU, for storing program instructions and variables for the operation of the CPU (Fig. 1, items 114.1, 112.1, and 152.1, col. 8, lines 14-24); and

cache memory, coupled to the CPU, for storing information related to the array of storage devices (Fig. 1, items 116.1, 112.1, 150, 110);

wherein a controller of the plurality of controllers initiates a task to be performed (concurrent processing by a plurality of RAID controllers) (col. 3, lines 10-18 and 43-56), the controller initiating the task establishes a task coordination data object (semaphores, as one as example) shared by the plurality of controllers (col. 3, lines 10-18 and 43-52, col. 11, lines 6-15, col. 12, lines 59-60), wherein the task coordination data object consists of task instructions, the task capable of being completed separately by one of the plurality of controllers to allow the task to be completed by way of the cumulative effort of the plurality of controllers completing separately the task (primary controller and secondary controller working together and completed in a cumulative effort such that the secondary controller completes the processing started by the primary controller) (col. 20, lines 18-34), and wherein a free controller (one of the plurality of RAID controlling elements) of the plurality of controllers selects a task available for completing separately and independently of the other controllers (col. 3, lines 22-58 and col. 4, lines 25-42, col. 12, lines 58-67 through col. 13, lines 22-63, col. 20, lines 18-34).

5. As shown above, DeKoning already teaches selecting a free controller from a plurality of controllers. However, DeKoning is silent in having discrete partitions of the task/process and selecting a task partition during the processing by the controller.

6. However, Perego discloses a controller partitioning the processing task into multiple portions and distributing each portion of the processing task to a rendering engine ([0032], [0033], Fig. 3, items 302, 304, 306), Fig. 4). Perego and DeKoning are analogous art because they are in the same field of endeavor of storage management. It would have been obvious to one of ordinary skill in the art to modify DeKoning's free controller such that it would include the teachings of Perego, specifically in that it would partition the processing task into multiple portions, select and distribute each portion of the processing task. The suggestion/motivation for doing so would have been to provide the predicted result of supporting parallel processing of data (page 1, [0001] of Perego).

7. DeKoning in view of Perego does not explicitly teach associating states with said task partitions.

8. However, Silberschatz teaches that during execution of every process, it changes state as it executes (page 91, Section 4.1.2 Process State). The state of a process is defined in part by the current activity of that process. Each process may be in one of the following states:

New: The process is being created.

Running: Instructions are being executed.

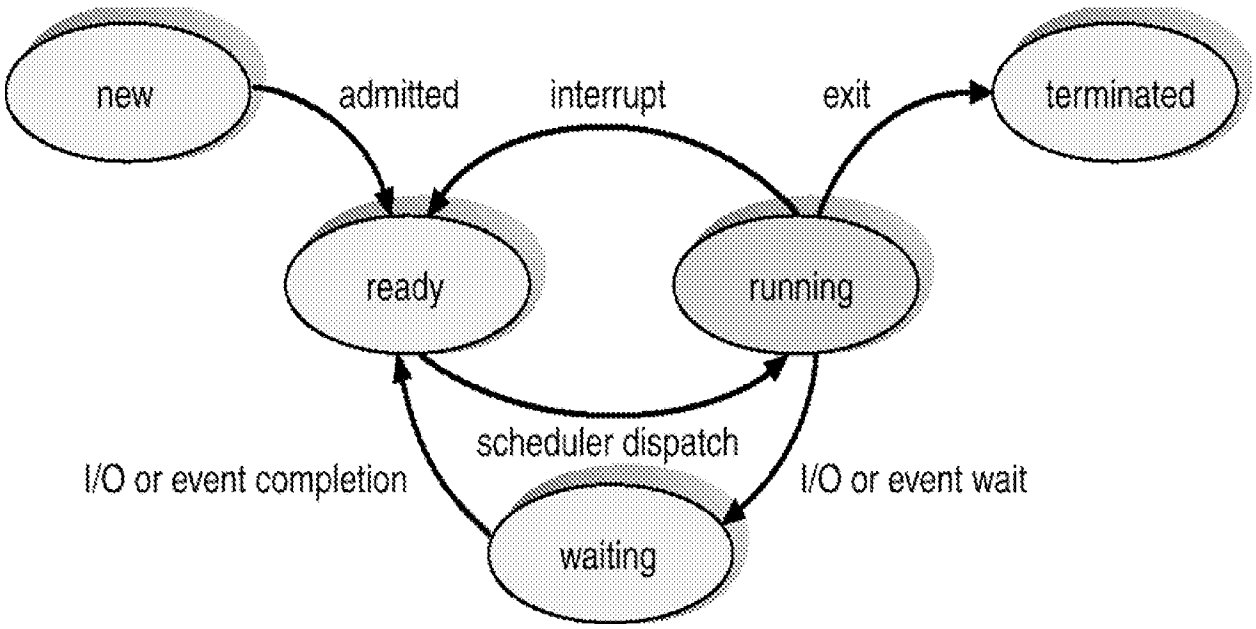
Waiting: The process is waiting for some event to occur

Ready: The process is waiting to be assigned to a processor.

Terminated: The process has finished execution.

These names are arbitrary, and vary between operating systems. The states that they represent are found on all systems, however. And states are included in the partitioned

processes, as they are just merely smaller processes of a larger process. The state diagram corresponding to these states is presented in the Figure below (page 90 Fig. 4.1):



Furthermore, every process is represented in the operating system by a process control block (PCB) – also called a task control block. A PCB contains elements of a process such as its process state, process number, program counter, registers, to name a few.

Finally, Silberschatz also discloses that a computer system is a collection of processes and objects. By objects, meaning both hardware objects (such as the CPU, memory segments, printers, disks, and tape drives), and software objects (such as files, programs, and semaphores) (pages 598, last paragraph through page 599, 1st paragraph).

9. One of ordinary skill in the art would have known to include the well known process states of ready, running, terminated, waiting, etc. that are normally included in a process to the processes/tasks of DeKoning and Perego. The suggestion/motivation would have been to provide the predicted result of being able to monitor or control task execution by a current state

of the process. Therefore, it would have been obvious to combine DeKoning, Perego and Silberschatz to obtain the invention of claim 1.

10. As to claim 2, DeKoning (RDAC #1, Fig. 1, 118.1 and RDAC #2, Fig. 1, 118.2) in view of Perego ([0032], [0033], Fig. 3, items 302, 304, 306), Fig. 4), and further in view of Silberschatz (page 91, Section 4.1.2 Process State) teaches a processor/controller that uses data objects that are discretely partitioned into various states of tasks such as a ready state, a state of execution (IN PROGRESS) state, an end (COMPLETE) state, etc.

11. As to claim 3, Silberschatz teaches wherein a controller selects a partition by examining the partitions in a READY state and selecting at least one partition in the READY state to operate on (page 91, Section 4.1.2 Process State).

12. As to claim 4, Silberschatz teaches wherein a partition is in an IN PROGRESS (running) state during processing (page 91, Section 4.1.2 Process State).

13. As to claim 5, Silberschatz teaches wherein a controller sets the partition selected for processing to a COMPLETE (terminated) state upon completion of processing for a partition (page 91, Section 4.1.2 Process State).

14. As to claims 6-8 and 10, they are rejected for the same reasons as stated in the rejections of claims 2-5.

15. As to claim 9, DeKoning teaches wherein the states provide a semaphore-mechanism for allowing a controller to ascertain whether to acquire control over a partition (col. 3, lines 50-54, col. 4, lines 1-11, col. 12, lines 37-58).

16. As to claim 11, DeKoning (col. 3, lines 22-58 and col. 4, lines 25-42, col. 12, lines 58-67 through col. 13, lines 22-63, col. 20, lines 18-34) in view of Perego ([0032], [0033], Fig. 3, items 302, 304, 306), Fig. 4), and further in view of Silberschatz (page 91, Section 4.1.2 Process State) teaches wherein the task coordination data object includes information about an operation to be performed and a data set to be operated on.

17. As to claims 12, 23, 34, and 42, they are rejected for the same reasons as stated in the rejection of claim 1.

18. As to claims 13-19 and 21-22, these limitations are taught in Moriyama as shown in the rejections of claims 2-8 and 10-11.

19. As to claims 20 and 31, they are rejected for the same reasons as stated in the rejection of claim 9.

20. As to claims 24-30 and 32-33, these limitations are taught in Moriyama as shown in the rejections of claims 2-8 and 10-11.

21. As to claims 35-41, they are rejected for the same reasons as stated in the rejections of claims 2-6 and 10-11.

Response to Arguments

22. During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

23. Claims 1-42 have been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed.
It is the Examiner's position that the term "the task to be completed by way of the cumulative effort of the plurality of controllers completing separately the partitions of the task" was not found in the specification. The applicants respectfully disagree that the cited term does not meet the written description requirement. However, in order to expedite prosecution, the cited term has been deleted from the claims.

The rejection under 35 U.S.C. 112, first paragraph has been withdrawn by the Examiner.

24. Claims 1-42 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is the Examiner's position that in claim 1, the term "completely separately the partitions" (line 16) is spelled incorrectly and grammatically incorrect. As noted above, the term has been deleted from the claims and therefore it is respectfully submitted that the rejection is moot.
The claims have further been amended to substitute the term ""comprises" for the term ""consists of". As set forth above, claims have been amended to overcome § 112 objections and rejections raised for the first time by the Examiner in the latest Office Action.

The rejection under 35 U.S.C. 112, second paragraph has been withdrawn by the Examiner.

25. Applicant's arguments regarding the prior art have been fully considered but are moot in view of the new grounds of rejections.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- **Lindsay (US 6,564,267 B1)** discloses a plurality of controllers such as MAC controller 70 and MAC controller 72, wherein MAC 70 is the free controller that provides task partitioning (col. 8, lines 1-19).
- **Rehg (US 6,480,876 B2)** teaches a controller 530 that splits and partitions tasks into a subset of data chunks and selects one of the partitions (see Abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENNETH TANG whose telephone number is (571)272-3772. The examiner can normally be reached on 8:30AM - 6:00PM, Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/
Supervisory Patent Examiner, Art Unit 2195

/Kenneth Tang/
Examiner, Art Unit 2195